



UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/241,851	02/02/99	NAKAI T	865.4335

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EXAMINER

CHANG, A

ART UNIT PAPER NUMBER

2872

DATE MAILED: 10/11/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/241,851

Applicant(s)

NAKAI, TAKEHIKO

Examiner

Audrey Y. Chang

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Prosecution Application

1. The request filed on July 24, 2001 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/241,851 is acceptable and a CPA has been established. An action on the CPA follows.
2. This Office Action is also in response to applicant's preliminary amendment filed on July 24, 2001, which has been entered as paper number 18.
3. By this amendment, the applicant has amended claims 18 and 19. Claims 1-7 and 9-19 remain pending in this application.
4. The rejections to claims 1-9 and 9-19 under 35 USC 112, first paragraph, set forth in the previous Office Action dated January 9, 2001 are withdrawn in response to applicant's amendment.
5. The rejections to claims 18 and 19 under 35 USC 112, second paragraph, set forth in the previous Office Action dated January 9, 2001 are withdrawn in response to applicant's amendment.

Drawings

6. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "R" and "r" have both been used to designate the curved surface of the chamfered regions. Correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 2872

8. Claims 18 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 18 and 19 each recites the phrase "a diffractive optical element according to any one of claims ... 20-22" that appears to be vague and indefinite since there are no claims 20-22.

The phrase "each of said pair of diffractive gratings comprises a flat surface" recited in claim 18 and the phrase "each of said pair of diffractive gratings comprises a curved surface" recited in claim 19 appears to be vague and indefinite since it is not clear where is this flat surface or this curved surface. It is not clear if this means that the each of the said pair of gratings assumes a shape of flat or curved. The specification does not give support for the pair of gratings to have curved surface. It is not clear then if this means that the "flat surface" or the "curved surface" is at the chamfered regions at each of the grating grooves, as shown in Figures 9 and 12. Clarifications are required.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 11, 12 and 13-17 depended therefrom are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Ishii (PN. 6,157,488).

Ishii teaches a diffractive optical element that is comprised of a pair of diffractive gratings (21, 22 in Figure 6, 201, 202 in Figure 8) that are formed at interface between a first and second optical regions (11, 12 in Figure 6 or 101, 102 in Figure 8) and at the interface between the second and a third optical

Art Unit: 2872

regions (12, 13 in Figure 6 or 102, 103 in Figure 8), respectively. Ishii teaches that the different optical regions have different refractive indices and different dispersion, (please see column 13, lines 35-54). Ishii teaches that the diffractive optical element has the diffraction efficiency that is independent from the wavelength in the visible range and the diffraction efficiency achieves maximum value for a range of wavelengths within the visible range, (please see Figures 10 and 11). In fact, the first order diffraction efficiency becomes maximum for at least two wavelengths this implies that the maximum optical path difference is equal to the diffraction order ($m=1$) times the two wavelengths respectively, (please see Figure 10).

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the second optical region is a region with index refraction equal 1. However Ishii has taught the details and the equations for designing such diffractive optical element base on the optical properties, namely the refractive indices and thickness, for each of the optical regions it would then have been obvious to one skilled in the art to choose air (with index of refraction of 1) as the second optical region since it has been held when the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. Furthermore, air is also a very well known optical material for the optical regions in the art and it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended used as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

With regard to claim 12, Ishii teaches that the diffractive gratings have blaze type relief patterns.

With regard to claim 13, Ishii teaches that the diffractive optical element (41) may be used with a lens (51) within an image pick-up system (60), (please see Figure 22).

With regard to claims 15-16, Ishii teaches that the optical regions may include optical material such as ultraviolet curable resin, (please see column 13, line 40). Although this reference does not teach explicitly that each pair of the diffractive gratings are made of such resin however it has been held to be

Art Unit: 2872

within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

11. Claims 2-7, 9-10 and 13-19 dependent therefrom are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Ishii in view of the patent issued to Sakai et al (PN. 5,279,924).

Ishii teaches a diffractive optical element that is comprised of a pair of diffractive gratings (21, 22 in Figure 6, 201, 202 in Figure 8) that are formed at interface between a first and second optical regions (11, 12 in Figure 6 or 101, 102 in Figure 8) and at the interface between the second and a third optical regions (12, 13 in Figure 6 or 102, 103 in Figure 8), respectively. Ishii teaches that the different optical regions have different refractive indices and different dispersion, (please see column 13, lines 35-54). Ishii teaches that the diffractive optical element has the diffraction efficiency that is independent from the wavelength in the visible range and the diffraction efficiency achieves maximum value for a range of wavelengths within the visible range, (please see Figures 10 and 11). In fact, the first order diffraction efficiency becomes maximum for at least two wavelengths this implies that the maximum optical path difference is equal to the diffraction order ($m=1$) times the two wavelengths respectively, (please see Figure 10).

This reference has met all the limitations of the claims with the exception that it does not teach explicitly that the second optical region is a region with index refraction equal 1. However Ishii has taught the details and the equations for designing such diffractive optical element based on the optical properties, namely the refractive indices and thickness, for each of the optical regions it would then have been obvious to one skilled in the art to choose air (with refractive index of 1) as the second optical region since it has been held when the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

Furthermore, air is also a very well known optical material for the optical regions in the art and it has

Art Unit: 2872

been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

This reference also does not teach explicitly that the peak portions and/or the valley portions of the diffractive gratings are formed in a chamfered shape. Sakai et al in the same field of endeavor teaches a method for manufacturing optical diffractive grating wherein the optical diffractive grating are made to have serrated grating portion (13) (i.e. flat surface) at the peak of the grating and curved surface (20) at the valley of the grating, (please see Figures 2, 3(a) and 3(b)) for improving the diffraction efficiency of the diffractive grating. It would have been obvious to one having ordinary skill in the art to apply the teachings of Sakai et al to modify the diffractive optical element of Ishii to make the diffractive gratings have chamfered regions for the benefit of improving the diffraction efficiency.

With regard to claim 12, Ishii teaches that the diffractive gratings have blaze type relief patterns.

With regard to claim 13, Ishii teaches that the diffractive optical element (41) may be used with a lens (51) within an image pick-up system (60), (please see Figure 22).

With regard to claims 15-16, Ishii teaches that the optical regions may include optical material such as ultraviolet curable resin, (please see column 13, line 40). Although this reference does not teach explicitly that each pair of the diffractive gratings are made of such resin however it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

With regard to claims 18 and 19, although these references do not teach explicitly about the claimed sizes for the flat surface of the serrated grating portion and the curvature of the curved surface of the grating however such modifications are considered to be obvious matter of design choices to one skilled in the art since it involves merely change in the size. A change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955).

SEARCH REQUEST FORM

Requestor's

Name:

Dulie Reeves

Serial

US 08/451,120

Number:

PCT/US 96/07690

Date:

2 Aug 96

Phone:

308-7553

Art Unit:

1813

Search Topic:

Please write a detailed statement of search topic. Describe specifically as possible the subject matter to be searched. Define any terms that may have a special meaning. Give examples or relevant citations, authors keywords, etc., if known. For sequences, please attach a copy of the sequence. You may include a copy of the broadest and/or most relevant claim(s).

Please search following claims in Aps + SM / Analogs.

Hybrid targeting molecules $F(ab')_2$
treatment or visualization ligands.

Protein A, protein G immuno adsorbent

liposome attached to antibody

liposome attached to ligand

targeting CD4 T4 lymphocytes claim 28
HIV-1

Please record results on 3 1/2" disc

Many thanks!

Dulie